REMARKS

In light of the above amendatory matter and remarks to follow, reconsideration and allowance of this application are respectfully solicited.

Claims 31 and 37 are amended for the purpose of clarifying the recitations therein. Claims 31-33 and 35-37 are presented for consideration.

It is submitted that these claims, as originally presented, are patentably distinct over the prior art cited by the Examiner, and that these claims were in full compliance with the requirements of 35 USC 112. Changes to these claims, as presented herein, are not made for the purpose of patentability within the meaning of 35 USC sections 101, 102, 103 or 112. Rather, these changes are made simply for clarification.

In the Office Action under reply, Claims 31 and 35-37 are rejected under 35 USC 103 as being obvious in view of the combination of Kato (U.S. Patent 5,675,379 -- newly cited), Hoogenboom (U.S. Patent 5,517,250) and Schiefer (U.S. Patent 6,177,922). Claims 32 and 33 are rejected under 35 USC 103 as being obvious over the aforementioned combination, further combined with Azadegan (U.S. Patent 5,612,900).

Claim 31 is independent and is directed to a video encoding system. Claim 37 also is independent and is directed to the video encoding method performed by the system of claim 31. Claims 31 and 37 recite very similar limitations; and in the interest of brevity, the following discussion is directed to claim 31; but it should be understood that this discussion is equally applicable to claim 37.

It is respectfully submitted, claims 31 and 37, as previously presented, were patentably distinct over the combination of references relied upon in the Office Action under reply.

Nevertheless, these claims are amended to avoid a possible ambiguity that may have resulted in the rejection here under reply. Claims 31-33 and 35-37 are presented for reconsideration.

As discussed in previous submissions, Applicants' invention addresses the problem of the delay in creating the packetized elementary stream from, for example, MPEG-encoded data (see pages 2-6 of Applicants' specification). MPEG-encoding creates I, P and B pictures as a compressed representation of input video frames. The order in which these compressed pictures, or frames, are created differs from the order in which these compressed frames are transmitted because the order in which these frames are transmitted is the order in which they are decoded so as to recover the original pictures. The transmitted I, P and B pictures are packetized; and included in the packets are presentation time stamps (PTS) for each picture, or frame, representing the time at which that picture is to be displayed, and decoding time stamps (DTS) for each picture, representing the time at which that picture is to be decoded. For example, and as shown in Fig. 2A of the instant application, the original video frames are MPEG-encoded as I1 B2 B3 P4 B5 B6 P7 ... pictures, which is the presentation sequence, but the I1 and P4 pictures are needed to decode the B2 and B3 pictures. Hence, the order in which these pictures are arranged for transmission is the order in which those pictures should be received for decoding, and this is different from the order in which the pictures are displayed (or presented). Consequently, to decode the B pictures properly, the MPEG-encoded pictures should be received in the decoding order as I1 P4 B2 B3 P7 B5 B6 P10 ...as shown in Fig. 2B.

Packetizing adds to each picture the PTS and DTS needed to decode and display the picture frames in the proper order. However, since the PTS represents the time at which that picture is displayed, the correct PTS for a picture cannot be generated until the picture type is

determined -- that is, until it is determined whether the picture is a P or a B picture. Moreover, the number of B pictures interspersed between successive P pictures is not fixed. Therefore, since a P picture is to be displayed after B pictures, the PTS for that P picture must be delayed until the correct number of B pictures that precede the P picture are counted. As a result, the encoding process is delayed. See the explanation at page 5 of Applicants' specification. Applicants recognized that the delay in generating the PTS's for the compressed pictures is (n+2) frames, where n is the number of successive B pictures interspersed between successive P pictures or between an I picture and the next-following P picture.

This delay in generating the PTS's is further complicated when the frame rate, or frame frequency, of the input video data is changed, such as by a 3:2 pull-down conversion, for example, from an input frame rate of 24 Hz to an output frame rate of 30 Hz. When so converted, the pictures that constitute the elementary stream ES are formed of 2 or 3 fields, as shown and described with reference to Applicants' Fig. 7 and the PTS and DTS for each frame is dependent upon the frame structure and picture type (i.e. the number of fields in that frame and whether that frame is an I, P or B picture).

Applicants' invention, as defined by claim 31 (and also by claim 37) overcomes the problem of delay in packetizing the encoded pictures, and particularly the delay in generating the PTS and the DTS, by counting the fields of the input video data, generating picture order information (e.g. I1 P4 B2 B3 P7 B5 B6 P10 ...) based on the field count, producing a presentation time stamp count that corresponds to the field count, producing a decoding time stamp count and inserting the presentation and decoding time stamp counts into the packetized elementary stream. **By using the field count to generate the picture order information and the presentation time stamp count, it is not necessary to wait until the arrival of a P picture**

to then generate the presentation time stamp counts for the preceding P and B pictures.

Hence, the problem of delay, mentioned above, is avoided.

This improvement and the novel features of the invention are defined by claim 31 which recites, *inter alia*:

> counting means for counting fields in the input video data having said particular frame frequency [which was converted from a second frame frequency] to produce a count;
>
> ***
>
> ... said encoding means generating said picture order information based on the fields counted in said counting means; said picture order information including a presentation time stamp count corresponding to the count of said counting means and a decoding time stamp count representing decoding times for the pictures of said elementary stream ...

It is submitted that Kato, Hoogenboom and Bennett, taken alone or in combination as the Examiner has attempted to do, fail to disclose the aforequoted features recited in claim 31. Kato describes an MPEG encoder that operates on picture signals from a film source whose frame frequency was converted from 24 frames/sec. to 30 frames/sec. and removes redundant fields from the 30 frames/sec. signals. Kato also describes several counters, namely, base-N counter 350, field number counter 312 and frame bit counter 306 in Fig. 6. But, Kato does not suggest that the count of any of these counters can or should be used to generate picture order information, a presentation time stamp count or a decoding time stamp count. As acknowledged in the Office Action, "Kato discloses an apparatus that ... comprises 'counting fields in the input video data having a particular frame frequency' ... [h]owever, Kato fails to disclose the picture order information and the extracting means as claimed." But, Hoogenboom was relied upon for allegedly teaching Applicants' claimed,

> encoding means ... to generate an elementary stream ... including ... picture order information ... based on the fields counted in said counting means; said

> picture order information including a presentation time stamp count corresponding to the [field] count of said counting means…"

The Examiner is correct in noting that "time stamp information is necessary in order to properly transmit the packet over a network;" but the need for the time stamp is not for transmission. Rather, the time stamp is needed for proper decoding and proper presentation of encoded pictures. Hoogenboom fails to suggest how his time stamp is produced. Hoogenboom discusses a *decoder*, not an **encoder**. Hoogenboom discusses only DTS, **not PTS**. Hoogenboom recovers DTS, he **does not generate a time stamp based on the field count**. Hoogenboom recovers, i.e. he *decodes*, picture order, he does not generate picture order information in an **encoder**. Since he is directed to a *decoder*, he simply *recovers DTS and PTS from packet headers*. He **does not count fields**. He does not generate PTS **as a result of the field count**. Hoogenboom simply states that time stamp information is obtained from the PES header (see Hoogenboom's Abstract, col. 3, lines 7-16 and 34-41; col. 4, lines 15-22; col. 7, lines 6-14; col. 8, lines 9-18 and 27-32; and col. 8, lines 38-65). He does not describe or suggest how this time stamp information gets into the header. Clearly, there is no teaching of generating picture order information that includes "a presentation time stamp count corresponding to the [field] count of said counting means," as recited by Applicants' claims 31 and 37.

Schiefer was relied upon for a feature other than the aforequoted recitation of Applicants' claim 31. The Examiner is correct in not relying upon Schiefer for an alleged teaching of generating picture order information that includes "a presentation time stamp count corresponding to the [field] count of said counting means."

Thus, even if Kato, Hoogenboom and Schiefer are combined, the resultant teachings of that combination still fail to suggest generating picture order information that includes a

presentation time stamp count corresponding to the field count of said counting means." This combination does not describe,

> encoding means ... to generate an elementary stream ... including ... picture order information ... based on the fields counted in said counting means; said picture order information including a presentation time stamp count corresponding to the [field] count of said counting means..."

It is respectfully submitted, that the piecemeal assemblage of bits and pieces from each of Kato, Hoogenboom and Schiefer fails to suggest to one of ordinary skill in the art the features of Applicants' invention that solve the problem of delay in creating the packetized elementary stream from encoded picture data, especially if that encoded picture data is converted from one frame frequency to another. One of ordinary skill in the art will recognize that Hoogenboom is concerned with recovering time stamp information from received compressed video data as opposed to generating that time stamp information from counting fields and, thus, would not be enabled by Hoogenboom to make and use Applicants' claimed invention, and particularly, Applicants' claimed "encoding means."

Claim 37 is directed to the method performed by the system of claim 31. Claim 37 recites the same elements, in method context, as are recited by claim 31. That these elements are not suggested by the prior art has been pointed out above. Accordingly, claim 37 is patentably distinct over the combination of Kato, Hoogenboom and Schiefer for the very same reasons discussed above. The rejection of claim 37 should be withdrawn.

Claims 32-33 and 35-36 depend from and further limit the system defined by claim 31. Since claims 32-33 and 35-36 thus include the same elements as are recited by claim 31, these dependent claims are patentably distinct over Kato, Hoogenboom and Schiefer for the reasons argued above. The addition of Azadegan (U.S. Patent 5,612,900) to meet the terms of dependent

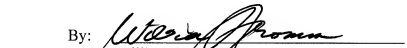
claims 32 and 33 fails to cure the aforenoted deficiencies of Kato, Hoogenboom and Schiefer. Hence, claims 32 and 33 are patentable over the extended combination of Kato, Hoogenboom, Schiefer and Azadegan. The rejection of claims 32-33 and 35-36 should be withdrawn.

Statements appearing above in respect to the disclosures in the cited references represent the present opinions of the undersigned attorney and, in the event the Examiner disagrees with any of such opinions, it is respectfully requested that the Examiner specifically indicate those portions of the references providing the basis for a contrary view.

Please charge any additional fees that may be needed, and credit any overpayment, to our Deposit Account No. 50-0320.

Respectfully submitted,

FROMMER, LAWRENCE & HAUG LLP
Attorneys for Applicant

By: 

William S. Frommer
Reg. No. 25,506
(212) 588-0800